CHEMISTRY.

91. *New Compound of Silica and Potassa.*—"This compound, which has been prepared and described by M. Frens, is intermediate between glass and the oil of flints. It may be prepared by saturating a boiling solution of potash with recently precipitated silica; but better by the following process. Fuse a mixture of ten parts carbonate of potash, fifteen of quartz, and one of charcoal; pulverize the product, and dissolve it in four or five parts of boiling water, which will slowly take up nearly the whole. The solution, evaporated until of a specific gravity of 1.24, will be a viscid, opalescent liquid, which, whether evaporated further, quickly or spontaneously, will become a solid, vitreous, transparent mass, fixed in the air, and resembling ordinary glass, except that it is less hard.

"This substance has an alkaline action, it dissolves with difficulty in cold water, more easily in boiling water. It is somewhat hygrometric, and in many weeks will attract moisture from the air, which penetrating it, does not however destroy its aggregation, but causes the surface to become covered with scales or powder. Alcohol precipitates the aqueous solution; acids decompose the substance; many salts form insoluble precipitates with it. This new silicate of potash is composed of sixty-two parts silica, twenty-six of potash, and twelve of water. It may be employed as a coating for wood and other objects to preserve them from fire, and also as a lute in the laboratory."—*Lond. Med. and Surg. Journ. Feb.* 1829, *from Kastner's Archives.*

92. *Discovery of the Mode of Making the Diamond.*—"At a meeting of the Academy of Sciences, on November 3d, M. Gaval stated that he employed phosphorus for the purpose of decomposing the carburet of sulphur, by which the carbon was set at liberty under the form of small crystals, having all the properties of the diamond, and possessing the power of cutting or scratching the hardest bodies. If sticks of phosphorus are introduced into a matrass containing carburet of sulphur, covered with a layer of water, as soon as the phosphorus comes in contact with the carburet, it dissolves as it would in water of 140° or 158° of Fahrenheit, and is precipitated to the bottom of the vessel. The mass then consists of three distinct layers: the upper part of pure water, the second of carburet of sulphur, the third of liquified phosphorus. If the liquor is agitated while in this state, so as to mix the different substances, it becomes milky and turbid, and after remaining some time still, it separates anew, but apparently into two layers. The upper is formed by pure water, and the lower by phosphuret of sulphur. Between these layers is a very thin one of white powder, and which, when the matrass is held towards the rays of the sun, produces all the effects of a prism, and consequently seems to be formed by minute crystals.

"The author, encouraged by this experiment, endeavoured to obtain more voluminous crystals, which he succeeded in doing by means of the following process:—He introduced into a matrass, which was perfectly still, first eight ounces of water, then eight ounces both of carburet of sulphur and of phosphorus. As in the preceding experiment, the phosphorus first dissolved, and the three liquids took their stations in the vessel according to their specific gravities. After twenty-four hours, a very thin pellicle, consisting of a white powder intermixed with air bubbles and different centres of crystallization, was formed. After some days these pellicles gradually increased in thickness. The separation of the two lower liquids became less distinct, and after three months they seemed but one substance. The experiment having been left in action for another month, it became necessary to discover the mode of separating the crystallized substance from the phosphuret of sulphur, which was difficult on account of the inflammable nature of the substance. After various trials, more or less successful, the author determined to filter the whole through cha-

mois leather, which he placed under a glass bell, renewing the air from time to time. At the end of a month the skin was washed and dried, when M. Ganal was enabled to examine the crystallized substance which remained on its surface. Exposed to the rays of the sun, it presented numerous crystals, reflecting all the colours of the rainbow: twenty among them were large enough to be raised with the point of the knife; three others were as large as a millet seed. The latter were submitted to the inspection of M. Champigny, director of the jewellery workshops of M. Petelot, and they appeared to him to be real diamonds. M. Gay-Lusac stated that to his knowledge, M. Ganal had been occupied in the same research for a period of eight years.

"Five years since, in the month of January, 1824, M. Delatour deposited with the French Academy of Sciences a paper, whose contents were then unknown, but have since proved to relate to the manufacture of the diamond, and contain, we presume, the results of the first essays of this gentleman. The method is still a secret, and said to be essentially different from that of M. Ganal just described.

"On the 11th of November, glass tubes were exhibited to the Academy, filled with diamond dust, or, (to speak more accurately,) carbon crystallized by art. The different specimens were not obtained by the same method. The chemical properties are the same, but in appearance and hardness they are strikingly different.

"One of the tubes contains a very transparent small crystal, whose form is distinctly pyramidal. M. Delatour expects to present to the academy crystals of four or five lines in diameter.

"M. Arrago remarked on this occasion, that it would be easy to ascertain the nature of one of the crystals, as its 'facettes' were sufficiently large to show the angle of prolongation. He stated also that a person of his acquaintance entertained a hope that the decomposition of carburet of sulphur by the voltaic pile would be successful. The defective conductibility of this substance had hitherto impeded the success of the experiment, but it is confidently expected that this difficulty will be overcome."—*Lond. Med. and Phys. Journ. Feb.* 1829.

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93. *Nature of Aloctic Acid.*—M. Liebig finds this substance to be a combination of carbazotic acid and a particular substance having many of the properties of resins. The bitter of aloes may be formed in large quantity, by acting upon aloes with nitric acid of the specific gravity of 1.25. The substance obtained forms a purple salt with potash, but little soluble, and precipitating the salts of baryta, lead, and peroxide of iron, of a deep purple colour. When a solution of this salt was precipitated by acetate of lead, the water employed to wash the precipitate had a yellow colour, and deposited small crystals of the same colour. These crystals heated in water with sulphate of potash, gave carbazotate of potash, and from that carbazotic acid was obtained.

When aloes are treated with nitric acid of specific gravity 1.432, until the liberation of nitrous vapour ceases, and the liquid be mixed with a little water to separate a small quantity of bitter principle, then, by neutralization with potash and evaporation, a large quantity of carbazotate of potash in fine crystals is obtained.

Wool, morphia, narcotine and myrrh, did not give carbazotic acid by treatment with nitric acid.—*Annales de Chimie.*

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94. *Sugar of Liquorice.*—"The peculiar principle in the root glycyrrhiza has been long known. Doberuner and Robiquet have given processes for its separation. The following is by M. Berzelius:—The cut root is to be infused in boiling water; the cold filtered infusion is to have sulphuric acid added in small quantities, until no further precipitate is formed. The precipitate is a compound of the acid with the saccharine matter, and is to be washed at first with acidulated cold water, and then with pure water, until no free acid appears.

The precipitate is to be digested with alcohol, which leaves certain impurities, and then pulverized carbonate of potash or soda is to be added to the solution, until it is neutral; the clear liquor is to be decanted and evaporated. It is desirable to have a small excess of acid present, for which purpose put a little of the alcoholic liquor on one side, to be added at last to the neutral portion, and then leave the whole at rest, that the sulphate of potash may separate before the evaporation is effected.

"The saccharine principle is a transparent yellow mass, breaking like amber. Being heated it melts, and burns with a bright flame and much smoke. In powder it burns like resin or lycopodium. It does not change in the air. Its aqueous solution is precipitated by *all the acids*, and the more completely the stronger is the solution. The precipitates have no acid taste, but are sweet; they dissolve in water, and gelatinize upon cooling, if the solutions are strong.

"This substance also combines readily with bases forming soluble neutral solutions; those with baryta and lime are not precipitated by carbonic acid. This principle forms insoluble compounds with metallic acids and many metallic oxides. It combines also with many salts, causing their precipitation in some cases.

"The saccharine principle of the root of the wild liquorice, (*Polypodium vulgare,*) is altogether different in its qualities from the above substance."—*Journal of Science.*

95. *Iodine Detected in the Blood.*—M. Bennerscheidt has detected iodine in the crassamentum of the blood of a person who had employed for a long time frictions with iodine ointment. He could not find any indication of its presence in the serum.

96. *Benzoic Acid in the Grasses.*—"Benzoic acid has been found by M. Vogel in the sweet-scented vernal grass, (*Antoxanthum odoratum,*) and in the sweet-scented soft grass, (*Holcus odoratus.*) It is these two grasses which communicate to hay the aroma peculiar to themselves."—*Lond. Med. and Surg. Journ. Nov.* 1829.

97. *New Alcali in the Eupatorium Cannabium.*—M. Righini has discovered a new alcali in the *Eupatorium cannabium,* to which he has given the name of Eupatorine, and which he considers as the active principle of this plant. This substance is obtained in the form of a white powder; has a taste sui generis; is insoluble in water; soluble in sulphuric ether and diluted alcohol. It swells in the fire and burns. It combines with sulphuric acid, and crystallizes in needles. M. R. has obtained Eupatorine in too small quantities to try its medical properties.—*Repertorio di Medic. Torino, August,* 1828.

MISCELLANEOUS.

98. *Medical Statistics of the Netherlands.*—From the researches of the Royal Commission of Statistics of the Netherlands, it appears that the excess of male children over those of the female sex is 1 to 0.9427; thus in the course of ten years there were 30,485 boys born above the number of girls; but the mortality among the males is greater than among the females, and in ten years this excess was 25,400; so that at the end of ten years the excess of the males was only 5,085. The deaths throughout the kingdom are 1 in every 39 86-100 persons, and the births 1 for every 28 16-100 persons. One of the most curious and interesting approximations of two natural phenomena, however, connected with population, is that stated in M. Quentelet's "Researches on the Population, Number of Births, Prisons and Poor-houses, in the Kingdom of the Netherlands." It appears from a series of observations, made for the space of eighteen